

PART I – FLIGHT TIME/DUTY TIME

B. FLIGHT AND DUTY TIME LIMITATIONS AND REST REQUIREMENTS

SOURCE – Board 1996; AMENDED – Executive Board October 2009

There is a sufficient body of scientific information to provide limitations for prescriptive fatigue management regulations. The following policy adopts in principal the draft ICAO framework and IFALPA policy. It is intended to provide guide lines which take into account available science and the performance decrements that are known to arise from sleep loss, circadian disruption and workload engendered by current flight and duty practices. While science cannot provide the answer to every conceivable situation that may arise the following guidance should provide an adequate level of crew alertness that ensures safe operations under most circumstances

Preamble

Flight time, flight duty period, duty period limitations and rest requirements are established for the sole purpose of ensuring that the flight crew members are performing at an adequate level of alertness for safe flight operations.

In order to accomplish this, two types of fatigue should be taken into account, namely, transient fatigue and cumulative fatigue. Transient fatigue may be described as fatigue that is dispelled by a single sufficient period of rest or sleep. Cumulative fatigue occurs after incomplete recovery from transient fatigue over a period of time.

The following limitations based upon science will provide safeguards against both kinds of fatigue.

1. General

The following incorporates ICAO and IFALPA guidelines and represents a comprehensive framework, in concept and in detail, of a flight and duty time and rest requirement scheme. The concepts within this framework demonstrate a scientific way of addressing both short-term and cumulative (long-term) fatigue safeguards for all Part 121 and 135 operations. It should be emphasized that the various parts of this framework are inter-related and therefore changing individual limits or practices specified in this policy may significantly erode the protection given as a whole. This policy is based on operational experience and scientific study.

- a. The demand for limitations on the duty periods, flight duty time, block time and rest period of flight personnel in civil aviation is based on recognition of the fact that excessive working hours affect flight safety.
- b. The flight duty and rest time regulations, being essential to safety, should be considered to be the minimum requirements and should be given the force of law.
- c. The regulatory limitations established in this policy, however, are not intended to prevent MECs from seeking to establish improved conditions for purposes of enhancing flight safety, by means of collective agreements.

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- d. An operator should include in his Operations Manual a flight and duty time limitations and rest scheme complying with the provisions of this policy.
- e. No person shall act as a flight crew member if he/she knows or suspects that he/she is suffering from, or is likely to suffer from, such fatigue or feels unfit in such a way as to endanger the safe conduct of the flight.
- f. Planned operations shall be scheduled in advance to allow for flights to be completed within the scheduled flight duty period taking into account the time necessary for pre- and post-flight duties, the flight and the turn-around times and the nature of operation.
- g. An operator shall prepare and publish planned and re-planned duty rosters, taking account of the effects of circadian rhythm disruptions and sleep deprivation, sufficiently in advance to provide the opportunity for flight crew members to plan adequate rest for the duty envisaged.
- h. Both flight crew members and Operators should be aware that a lack of sustenance can prove detrimental to an individual's performance and level of vigilance.

2. Definitions.

- a. Acclimated - The physiological and mental state of a crew member whose bio-rhythms and bodily functions are considered aligned with local time. At home base, a crewmember should be considered to be acclimated after spending the number of consecutive nights in home base specified in Table F. The crew member should be considered to be acclimated to a new location, when the crew member is given 3 consecutive physiological nights' rest at that location to enable Tables B and C to be applied. This is defined as two hours one side of the home base, or acclimated location, or one hour either side. A crew member ceases to be acclimated when a duty ends at a location outside the acclimated time band.
- b. Airport/standby reserve - A defined period during which a flightcrew member is required by an air carrier to be at, or in close proximity to, an airport for a possible duty assignment.
- c. Assigned - Scheduled as defined in this section.
- d. Augmented flightcrew - A flightcrew that has more than the minimum number required to operate the aircraft to allow a flightcrew member to be replaced by another qualified flightcrew member for in-flight rest.
- e. Calendar day - A 24 hour period from 0000 through 2359.
- f. Air carrier – A corporation, certificate holder, person, organization, or enterprise operating an aircraft for compensation or hire.
- g. Deadhead transportation - Transportation of a flightcrew member as a passenger, by air or surface transportation when required by an air carrier.
- h. Duty - Any task that an air carrier requires a flightcrew member to perform including, but not limited to, pre and postflight duties, administrative work, training, deadhead transportation, aircraft positioning on the ground, aircraft loading, and aircraft servicing.

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- i. Duty period - A period that begins when an air carrier requires a flightcrew member to report for duty and ends when that person is free from all duties.
- j. Fatigue - A physiological state of reduced mental and/or physical performance capability resulting from lack of sleep and/or increased physical activity that can reduce a flightcrew member's alertness and ability to safely operate an aircraft or perform safety-related duties.
- k. Fatigue risk management system (FRMS) - A comprehensive range of procedures that are scientifically based and data-driven, allowing a cooperative and flexible means of managing fatigue. FRMS supplements but does not replace the specified baseline regulatory scheme. FRMS must be approved by the Regulator before it may be used in operational practice.
- l. Flightcrew member - A certificated pilot or flight engineer assigned to duty in an aircraft during a flight duty period.
- m. Flight duty period - A period that begins when a flightcrew member is required to report for duty that includes a flight, a series of flights, and/or positioning flights, and ends when the aircraft is parked after the last flight and there is no intention for further aircraft movement by the same flightcrew member. A flight duty period includes deadhead transportation before a flight segment without an intervening required rest period, training conducted in an aircraft, flight simulator or flight training device, and airport/standby reserve.
- n. Flight time, also known as "block to block" or "chock to chock" - Time that commences when an aircraft first moves for the purpose of flight and ends when the aircraft comes to rest after landing.
- o. Home base - The location designated by an air carrier where a flightcrew member normally begins and ends his or her duty periods.
- p. Lineholder - A flightcrew member that has a flight schedule and is not a reserve flightcrew member.
- q. Long-call reserve - A reserve flightcrew member who receives at least the minimum required rest period following notification by the air carrier to report for duty.
- r. Physiological night's rest - A sleep opportunity of at least eight hours that encompasses the hours 2200 through 0800 local time.
- s. Positioning flight - A flight conducted by an air carrier, that is not scheduled or a charter, for the purpose of ferrying, maintenance, or otherwise moving an aircraft between locations for any reason.
- t. Report time - The time that the air carrier requires a flightcrew member to report for a duty period.
- u. Reserve flightcrew member - A flightcrew member that an air carrier requires to be available to receive an assignment for duty.

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- v. Reserve availability period, also known as telephone availability period - A period of time an air carrier requires a reserve flightcrew member to be available for contact, (synonymous with phone availability period).
- w. Reserve duty period - The time from the beginning of the reserve availability period to the end of either the reserve availability period or assigned flight duty period, whichever is less.
- x. Rest facility - A bunk, seat, room, or other accommodation meeting certain minimum established standards that provides a flightcrew member with a sleep opportunity.
- y. Class 1 aircraft rest facility - A bunk or other surface that allows for a flat sleeping position, is separated from both the flight deck and passenger cabin to provide isolation from noise and disturbance and provides controls for light and temperature.
- z. Class 2 aircraft rest facility - A seat in an aircraft cabin that allows for a flat or near flat sleeping position with adequate seat pitch to ensure proper leg extension, provides leg and foot support and enhanced seat width; is separated from passengers by a minimum of a curtain to provide darkness and some sound mitigation; and is reasonably free from disturbance by passengers and/or flightcrew members.
- aa. Class 3 aircraft rest facility - A seat in an aircraft cabin or flight deck that reclines and provides leg and foot support, but does not have adequate seat pitch to ensure proper leg extension, and is not located in the coach or economy section of a passenger aircraft.
- ab. Rest period - A continuous and defined period of time, before and/or following a duty period during which a flightcrew member is free from all duties, including standby duties, and is not obligated to contact or be available for direct contact by an air carrier.
- ac. Scheduled - Times assigned by an air carrier when a flightcrew member is required to report or be available for duty.
- ad. Schedule reliability - The accuracy of the length of a scheduled flight duty period as compared to the actual flight duty period.
- ae. Short-call reserve - A reserve flightcrew member who does not receive at least the minimum required rest period following notification by an air carrier to report for duty.
- af. Split Duty - A flight duty period that has a break in duty that is less than a required rest period.
- ag. Suitable accommodation - A single occupancy, temperature-controlled facility with sound mitigations that provides a flightcrew member with the undisturbed ability to sleep in a bed and to control light.
- ah. Theater - A geographical area where local time at the flightcrew member's flight duty period departure point and arrival point differ by no more than 4 hours.
- ai. Transportation local in nature - Transportation from the point of last duty to an accommodation for the purpose of a rest period, or from an accommodation to report for a duty period that does not exceed 30 minutes under normal circumstances.

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- aj. Unforeseen operational circumstance - An unplanned event, including unforecast weather, equipment malfunction, or air traffic delay, that is beyond the control of an air carrier.
- ak. Window of circadian low - A period of maximum sleepiness that occurs between 0200 and 0559 during a physiological night on a person's home base or acclimated time.

3. Flight time limitation: Nonaugmented operations.

No air carrier may schedule and no flightcrew member may accept an assignment if the total scheduled flight time will exceed the limits specified in table A:

Table A—Maximum Flight Time (Block) Limits

Time of Report (Home Base)	Maximum Flight Time (hours)
0000-0459	7
0500-0659	8
0700-1259	9
1300-1959	8
2000-2359	7

4. Flight duty period: Nonaugmented operations.

- a. Except as for provided for in paragraph (b) below, no air carrier may assign and no flightcrew member may accept an assignment for a nonaugmented flight operation if the scheduled flight duty period will exceed the limits in specified in table B.

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Table B—Flight Duty Period: Nonaugmented Operations

Time of Report (Home Base or Acclimated)	Maximum Flight Duty Period (hours) for Lineholders Based on Number of Flight Segments						
	1	2	3	4	5	6	7+
0000-0359	9	9	9	9.	9	9	9
0400-0459	10	10	9	9	9	9	9
0500-0559	11	11	11	11	10	9.5	9
0600-0659	12	12	12	12	11.5	11	10.5
0700-1259	13	13	13	13	12.5	12	11
1300-1659	12	12	12	12	11.5	11	10.5
1700-2159	11	11	10	10	9.5	9	9
2200-2259	10.5	10.5	9.5	9.5	9	9	9
2300-2359	9.5	9.5	9	9	9	9	9

- b. For nonacclimated flightcrew member, the maximum flight duty period in table B is reduced by 30 minutes.
- c. For a nonacclimated flightcrew member who remains in theater, the maximum flight duty period may not exceed 9 hours until the flightcrew member becomes acclimated.
- d. Consecutive night duties for acclimatized crews.

No more than three consecutive duties may overlap the period 0100-0659.

Note 1: A fourth consecutive night duty period may be permitted if the minimum rest period between night duty periods is 14 hours or greater. A fifth consecutive night duty period may be permitted only if a FRMS process to ensure an appropriate level of alertness on duty is maintained and an adequate amount of sleep opportunity at a suitable accommodation during the scheduled break in duty.

- 5. Flight duty period: Augmented flightcrew.
 - a. In the event the scheduled operation of a single segment cannot be conducted in accordance with the flight block hour and duty period limits in tables A and B above, the flight block hour and duty period may be extended by augmenting the flightcrew.
 - b. Acclimated. For single segment flight operations conducted with an acclimated augmented flightcrew, no air carrier may assign and no flightcrew member may accept an assignment if the scheduled flight duty period will exceed the limits specified in table C:

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Table C—Flight Duty Period: Acclimated Augmented Flightcrew

Time of Report (Local Time)	Maximum Flight Duty Period (hours) Based on Rest Facility and Number of Pilots					
	Class 1 Rest Facility		Class 2 Rest Facility		Class 3 Rest Facility	
	3 Pilots	4 Pilots	3 Pilots	4 Pilots	3 Pilots	4 Pilots
0000-0559	13:50	16:05	12:55	14:20	11:45	12:15
0600-0659	15:10	17:40	14:10	15:40	12:55	13:25
0700-1259	16:00	18:00	15:25	17:05	14:00	14:30
1300-1659	15:10	17:40	14:10	15:40	12:50	13:20
1700-2359	13:50	16:05	12:55	14:20	11:45	12:15

- c. Nonacclimated. For single segment flight operations conducted with a nonacclimated augmented flightcrew, no air carrier may assign and no flightcrew member may accept an assignment if the scheduled flight duty period will exceed the limits specified in table D:

Table D—Flight Duty Period: Nonacclimated Augmented Flightcrew

Time of Report (Home Base)	Maximum Flight Duty Period (hours) Based on Rest Facility and Number of Pilots					
	Class 1 Rest Facility		Class 2 Rest Facility		Class 3 Rest Facility	
	3 Pilot	4 Pilot	3 Pilot	4 Pilot	3 Pilot	4 Pilot
0000-0559	13:15	15:20	12:20	13:35	11:15	11:45
0600-0659	14:30	17:00	13:35	15:00	12:15	12:50
0700-1259	15:50	18:00	14:50	16:25	13:30	14:00
1300-1659	14:30	17:00	13:35	15:00	12:20	12:45
1700-2359	13:15	15:20	12:20	13:35	11:15	11:40

Note: For a planned single segment flight using 4 pilots and a Class 1 Rest Facility, the Flight Duty Period (FDP) in Tables C or D may be increased with an approved FRMS.

- d. Multiple flight segments. Except as provided for in paragraph (e) below, no air carrier may assign and no flightcrew member may accept an assignment involving two flight segments when the total of both flight segments is greater than 7 hours of flight time unless during the flight duty period:
- (1) A minimum of 2 consecutive hours is available during the flight duty period for in-flight rest for each of the flightcrew members seated at the control stations during landing,
 - (2) A minimum consecutive period of 1 hour and 30 minutes is available for in-flight rest for the additional (augmented) flightcrew member, and

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(3) No flight segment may follow any single flight segment of greater than 7 hours.

- e. No air carrier may assign and no flightcrew member may accept an assignment involving three or more flight segments under this section unless the air carrier has an approved FRMS. The requirements of paragraphs d.1 and d.2 are the minimum acceptable consecutive time periods to provide adequate opportunity for in-flight rest.

6. Flight duty period: Split duty.

For a split duty period between the hours of 1700 - 0459, an air carrier may extend and a flightcrew member may accept a flight duty period which increases the allowable flight duty period by up to 50 percent of the time that the flightcrew member spent in a suitable accommodation up to a maximum flight duty period of 12 hours provided—

- a. The flightcrew member is given a minimum of 4 hours actual rest in a suitable accommodation, and
- b. The air carrier:
 - (1) Establishes a feedback process collecting actual operational data from flightcrew members and adjusts the schedule as necessary,
 - (2) Has a training program that includes information on fatigue and sleep education and mitigation and countermeasures strategies approved by the Regulator, and
 - (3) The extended duty operation is approved by the Regulator.

7. Flight duty period: Extension.

- a. In the event unforeseen circumstances arise, the pilot in command and air carrier may extend a flight duty period under tables A, B, C and D up to 2 hours.
- b. An extension to the normal maximum flight duty period for an operation must not occur on any consecutive calendar day or more than two times in any 168 consecutive hour period.
- c. No air carrier may schedule a flightcrew member for an extended flight duty period.

8. Deadhead transportation.

- a. Time spent in deadhead transportation is considered part of a flight duty period if it occurs before a flight segment without an intervening required rest period.
- b. Time spent in deadhead transportation is considered part of a duty period if it:
 - (1) Occurs after the final flight segment within a flight duty period or
 - (2) Consists entirely of time spent in deadhead transportation.
- c. Time spent entirely in deadhead transportation during a duty period must not exceed the flight duty period limit in table B or table D, if the next flight duty period is part of an augmented flight duty period, for the applicable time of start plus 2 hours.

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- d. A flightcrew member whose duty period consists entirely of time spent in deadhead transportation must be given a rest period equal to the length of the deadhead transportation but not less than the required rest in paragraph 11 below upon completion of such transportation.

9. Reserve duty.

- a. The maximum reserve (phone) availability period is 14 hours. This is a limiting value ONLY if the reserve is never called out, otherwise the limits in Table E below apply:

Table E—Short Call Reserve Duty Period: Nonaugmented Operations

Time of Start of RAP (Home Base or Acclimated)	Maximum Flight Reserve Duty Period (hours) Based on Number of Flight Segments						
	1	2	3	4	5	6	7+
0000-0359	13	13	13	13	13	13	13
0400-0459	14	14	13	13	13	13	13
0500-0559	15	15	15	15	14	13.5	13
0600-0659	16	16	16	16	15	15	14.5
0700-1259	16	16	16	16	16	16	15
1300-1659	16	16	16	16	15.5	15	14.5
1700-2159	15	15	14	14	13.5	13	13
2200-2259	14.5	14.5	13.5	13.5	13	13	13
2300-2359	13.5	13.5	13	13	13	13	13

- b. The maximum reserve duty period (phone plus FDP) is the LESSER of:

- (1) 16 hours measured from start of RAP,
- (2) FDP of assignment PLUS 4 hrs measured from start of RAP (and this is further adjusted if starting in the WOCL and not called during WOCL period) or
- (3) FDP of assignment as measured from START of FDP.

Note: For example: If the RAP started at 0100, called at 0115, show at 0300, then it would be the LESSER of:

- (1) RAP start 0100 + 16 hours = 1700
- (2) RAP start 0100 + 13.07 hours (FDP limit 9 hrs + 4 hrs + 7 minute WOCL adjustment) = 13.07 or
- (3) FDP start at 0300 + 9 hours FDP limit = 1200

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Note: This ensures that the reserve will NOT have an allowable FDP limit greater than the lineholder the reserve is paired with and does not impact the operator in any manner since the reserve and lineholder end point is the same.

- c. If all or a portion of a reserve flightcrew member's reserve availability period falls between 0000 and 0600, the air carrier may increase the maximum reserve duty period in table E by one-half of the length of the time during the reserve availability period in which the air carrier did not contact the flightcrew member, not to exceed 3 hours; however, the maximum reserve duty period may not exceed 16 hours.
 - d. If a reserve flightcrew member is assigned as part of an augmented flightcrew, the maximum reserve duty period may exceed the flight duty periods in tables C and D up to a maximum of 4 hours.
 - e. No air carrier may schedule and no reserve flightcrew member on long call reserve may accept an assignment for -
 - (1) A flight duty period or conversion to a short call reserve duty period unless the flightcrew member receives the required rest period specified in paragraph 11.
 - (2) A flight duty period that will operate into the flightcrew member's window of circadian low unless the flightcrew member receives 12 hours of notice from the air carrier.
 - f. Before and after each reserve availability period, a reserve flightcrew member must be given at least the required rest period specified in paragraph 11.
 - g. An air carrier may shift a reserve flightcrew member's reserve availability period under the following conditions:
 - (1) A shift to a later reserve availability period must not exceed 12 hours.
 - (2) A shift to an earlier reserve availability period must not exceed 5 hours, unless the shift is into the flightcrew member's window of circadian low, in which case the shift must not exceed 3 hours.
 - (3) A shift to an earlier reserve period must not occur on any two consecutive calendar days.
 - (4) The total shifts (i.e., the cumulative amount of increases and decreases) in a reserve availability period in paragraphs (h)(1) through (h)(3) must not exceed 12 hours in any 168 consecutive hours.
10. Cumulative fatigue limitations.
- a. No air carrier may schedule and no flightcrew member may accept an assignment if the flightcrew member's total flight duty period hours in any commercial flying will exceed the following:
 - (1) 60 flight duty period hours in any 168 consecutive hours and
 - (2) 190 flight duty period hours in any 672 consecutive hours.

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- b. Except as provided for in paragraph (c) of this section, no air carrier may schedule and no flightcrew member may accept an assignment if the flightcrew member's total duty period hours will exceed the following:
 - (1) 65 duty hours in any 168 consecutive hours and
 - (2) 200 duty hours in any 672 consecutive hours.
- c. No air carrier may schedule and no flightcrew member may accept an assignment if the flightcrew member's total flight time in any commercial flying will exceed the following:
 - (1) 100 hours in any 28 consecutive calendar day period and
 - (2) 1,000 hours in any 365 consecutive calendar day period.
- d. Before beginning any flight duty period, a flightcrew member must have been provided at least 30 consecutive hours free from all duty in any previous 168 consecutive hour period.

11. Rest period.

- a. For operations conducted within the 48 contiguous United States and the District of Columbia for US based carriers or within the 13 Canadian Provinces and Territories for Canadian based carriers —
 - (1) No air carrier may schedule and no flightcrew member may accept an assignment for a flight duty period unless the flightcrew member is given a rest period of at least 10 consecutive hours before beginning the flight duty period.
 - (2) In the event of unforeseen circumstances, the pilot in command and air carrier may jointly agree to reduce the rest period scheduled under paragraph 11.a.1 to no less than 9 consecutive hours.
 - (3) If a flightcrew member's actual series of flight duty periods impinge on the WOCL at least three times during the series, the flightcrew member must be given 2 physiological nights' rest upon completion of the series of flight duty periods and before beginning any other series of flight duty periods or upon return to home base, whichever occurs first.
 - (4) No air carrier may schedule a flightcrew member for more than three consecutive flight duty periods that infringe upon or encompass the entire WOCL unless the flightcrew member receives a minimum 14-hour rest before the fourth flight duty period infringing upon or encompassing the WOCL. Five consecutive flight duty periods infringing upon or encompassing the WOCL may be conducted only if the air carrier has a fatigue risk management system approved by the Regulator. The flightcrew member must be given at least 2 physiological nights' rest upon completion of the series of flight duty periods and before beginning any other series of flight duty periods or upon return to home base whichever occurs first.

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- b. For operations conducted outside the 48 contiguous United States and the District of Columbia for US based carriers or within the 13 Canadian Provinces and Territories for Canadian based carriers —
 - (1) No air carrier may schedule and no flightcrew member may accept an assignment for a flight duty period unless the flightcrew member is given a rest period of at least 14 consecutive hours before beginning the flight duty period. If the air carrier's operations specifications allow dispatch and operation of certain international flights under domestic operating rules then the provisions of paragraph 11.a. will be utilized.
 - (2) In the event of unforeseen circumstances, the pilot in command and air carrier may jointly agree to reduce the rest period scheduled under paragraph 11.b.1 to no less than 13 consecutive hours.
- c. No air carrier may reduce a rest period on any two consecutive calendar days or exceed 2 occurrences in any 168 consecutive hour period.
- d. No air carrier may schedule a flightcrew member for a reduced rest period as described in paragraphs 11.a.2 or 11.b.2.
- e. No air carrier may assign and no flightcrew member may accept assignment to any duty with the air carrier during any required rest period. During any required rest period, no air carrier may contact a flightcrew member, and no flightcrew member is obligated to contact or respond to any communications from the air carrier. The air carrier may establish an unobtrusive method to provide notifications to flightcrew members of schedule modifications before reporting for a flight duty period.
- f. Transportation local in nature that normally exceeds 30 minutes may not be included in the required minimum rest period and must be considered duty. Any circumstance that increases the transportation time beyond 30 minutes (such as road construction, traffic accident, vehicle malfunction, etc.) may not be included in the required minimum rest period.
- g. Recovery rest.
 - (1) If a flightcrew member is assigned to a series of flight duty periods that remain away from the flightcrew member's home base for more than 168 consecutive hours and crosses more than four time zones, the flightcrew member must be given a minimum 3 physiological nights' rest upon return to home base.
 - (2) A flightcrew member operating in a new theater must receive 36 hours of consecutive rest in any 168 consecutive hour period for recovery rest.
 - (3) An air carrier must not schedule a flightcrew member between international recovery rests for more than two rest periods between 18 and 30 hours in length while that flightcrew member is operating in a new theater; the rest periods must not be consecutive.
 - (4) When an acclimated crew member returns to base following a period of consecutive night duty periods that include duty during any part of the WOCL, the crew member should be provided with two local nights rest.

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- (5) Where crew members are not acclimated, upon return to home base, a recovery period should be provided that ensures a crew member’s body clock has recovered to home base local time before the start of the next duty. The time necessary to ensure complete recovery of the circadian rhythm varies as a function of the elapsed time away from home base and the maximum time difference from home base. Table F can be used to determine the number of local nights required to readapt within an hour of home base.

Table F – Number of Local Nights for Recovery on Return to Home Base

Elapsed Time Since Leaving Home base (h)	Maximum Time Difference from Home Base (h)						
	3	4	5	6	7	8-9	10-12+
60-84h	1*	1*	2*	2*	2*	2*	3
84-108h	2*	2*	2*	3	3	3	3
108-132h	2*	3	3	4	4	4	5
132-156h	3	3	3	4	4	5	5
156+h	3	3	4	4	5	5	6

Note 1: The values in Table F refer to eastward transitions (eastward outbound / westward homebound) only. * denotes that for westward transitions (westward outbound / eastward homebound) one extra day is required to be added to the value depicted.

Note 2 : When the elapsed time away from home base is less than 60 hours one full local night’s recovery rest should be provided on return to base, except when the returning flight duty period encroaches the WOCL, then an additional local nights rest will be added.

12. Air carrier responsibilities.

- a. No air carrier may assign a flightcrew member to a flight duty period if the flightcrew member has reported himself or herself not fit for duty or if the air carrier believes that the flightcrew member is not fit for duty.
- b. Each air carrier must implement a nonretribution policy allowing a flightcrew member to remove themselves from flight duty when too fatigued to continue the assigned flight duty period.
- c. Each air carrier must adjust—
 - (1) Its system-wide flight duty periods if the total actual flight duty periods exceed the planned scheduled flight duty periods 5 percent of the time over any calendar month, and
 - (2) Any scheduled flight duty period that is shown to actually exceed the schedule 15 percent of the time over any calendar month.

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- d. Each air carrier must submit a report detailing the scheduling reliability details and any adjustments required in paragraph (c)(1) and (2) of this section to the Regulator every calendar month in a form and manner prescribed by the Regulator.

13. Flightcrew member responsibilities.

Each flightcrew member must report for any scheduled flight duty period adequately rested and prepared and the flightcrew member must remove himself or herself from duty if they have reason to believe that they are not fit for duty.

14. Fatigue policy and education and training program.

- a. Each air carrier must—

- (1) Develop a fatigue policy, and

- (2) Implement a fatigue education and training program applicable to all employees of flight operations including (but not limited to) dispatch, crew scheduling, and systems operational control, and any employee providing management oversight of those areas.

- b. The fatigue education and training program must include information on—

- (1) The detrimental effects of fatigue, and

- (2) Strategies for avoiding and countering fatigue.

15. Fatigue Risk Management System (FRMS).

- a. A FRMS comprises a comprehensive range of procedures that are both scientifically based and data-driven, allowing a cooperative and flexible means of managing fatigue as part of an operator's Safety Management System (SMS). As FRMS will be company specific, there remains a requirement for the regulator to provide prescriptive flight and duty time rules for operators not embracing FRMS principles. Such a set of rules will also provide a base line against which the fatigue levels of any FRMS can be compared, and in the case where an FRMS does not provide at least an equivalent level of safety to the prescriptive scheme, provide a reversion. Operators may, subject to regulator approval, embrace FRMS for all or part of their operations, or have a totally prescriptive scheme.

The *purpose* [added ital.] of any FRMS is to ensure that flight crew members are sufficiently alert so that they can operate to a satisfactory level of performance and safety under all circumstances.

A FRMS supplements prescribed flight and duty time regulations and other competent independent scientific research based software tools by applying safety management principles and processes to proactively and continuously manage fatigue risk through a partnership approach requiring shared responsibility among management and crew members. It can therefore only operate in circumstances where all stakeholders, particularly the pilot body, support the operation of a FRMS and accordingly, an open reporting system and non-punitive working environment, sometimes referred to as a “just culture” is a prerequisite within the organization for a FRMS to exist because crew feedback is an essential component of the program. An FRMS must specify the prescriptive regulatory scheme upon which it is based. In the event of suspension,

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termination or revocation of FRMS, the carrier's affected operations shall revert to the baseline prescriptive scheme.

FRMS is intended to be used to supplement prescriptive fatigue management regulations as a means of ensuring that flight crew remain sufficiently alert during duty to achieve a satisfactory level of operational performance and hence safety under all circumstances. A well developed and managed FRMS integrates operational and scientific data such as physiological and behavioral measures in the scheduling of crew members by providing a balance between duty types, crew rest and recovery. In the case of extended flight duty periods with augmented crew, such as ultra long range (ULR) operations, the planning of in-flight rest can be optimized.

FRMS must be based on a partnership approach for which there is agreement between the operator, regulator and pilot body. As FRMS is a new emerging concept, a Memorandum of Understanding between principle stakeholders should form the basis of initial agreement and be the subject to on-going periodic review based on assessment of the effectiveness of the program in achieving its stated goals. The Memorandum of Understanding must include a mechanism for the representatives of the stakeholding pilots to suspend or terminate participation in the operator's FRMS in the event that the representatives of the stakeholding pilots determine in their discretion that the FRMS program's safety *purpose* is not being met.

Pilot representatives, either from, where such a body exists, an established organization independent of the company, or where such a body does not exist, independently elected directly by the pilots, must be included as members of the operator's Fatigue Management Steering Group. This committee will be fully involved in the initial development of the FRMS program, and shall be fully and directly the on-going oversight of the operator's FRMS program including the development of modifications of the FRMS to meet the program's safety *purpose*.

b. FRMS Basic Requirements

(1) An approved FRMS must include as a minimum the following:

- a) a fatigue risk management policy;
- b) a comprehensive education and awareness training program for all stakeholder personnel including fatigue countermeasures training;
- c) a fatigue management steering group with direct reporting line to the CEO/Accountable Manager.
- d) documented company procedures and processes for the oversight and implementation of the FRMS including a confidentiality agreement for any collected data;
- e) a crew fatigue reporting process with associated feedback;
- f) a process for fatigue risk assessment
- g) investigative processes for monitoring alertness levels through data collection and analysis;

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- h) safety and task risk assessment methodology where potential high areas of operational risk are identified;
 - i) procedures for reporting, investigating, and recording incidents that are attributable wholly or in part to fatigue;
 - j) processes for evaluating information on fatigue levels and fatigue-related incidents, undertaking interventions, and evaluating the effects of those interventions.
 - k) an operator internal audit program of key performance indicators to both crewmembers and the Regulator;
 - l) safety performance measurement;
 - m) a commitment to a positive safety culture including an open reporting system and non-punitive working environment, sometimes referred to as a “just culture”;
 - n) the extent to which prescriptive regulations may be deviated from, and the mitigation factors used to justify the deviation; and
 - o) a policy that encourages open and honest communications
- (2) An Operator’s FRMS Policy must address the following areas:
- a) a commitment from the highest levels of the organization;
 - b) a specified line of accountability for fatigue risk management in the organization;
 - c) a partnership approach among all effected personnel of the FRMS;
 - d) the identification of the work groups and operations covered by the FRMS;
 - e) the terms of reference for the Fatigue Management Steering Group including frequency of meetings;
 - f) the policies for identifying and managing employees who are fatigued to an extent that represents a safety risk, including considering provision for opting out of an assignment;
 - g) a commitment to provide training and resources;
 - h) a commitment to act on recommendations regarding fatigue risk management arising from internal audit; and
 - i) a commitment to a non-punitive, “just” organizational culture.
- (3) An Operator’s FRMS education and awareness training program must include at least the following:
- a) physiological effects of fatigue and fatigue recognition both as an individual and in others;

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- b) causes of fatigue and how to recover;
 - c) mitigation and countermeasure strategies;
 - d) planning rest and sleep;
 - e) circadian rhythm, circadian low, and how to best mitigate its effect;
 - f) the operator's FRMS including operator and crewmember responsibilities; and
 - g) diet and exercise, use of prescription medication, and family / lifestyle issues;
 - h) specifically tailored training for scheduling and crew staffing personnel to assess the fatigue risks of the patterns of work and the cumulative effects of those patterns of work on pilots fatigue levels.
- (4) The Operator's Fatigue Management Steering Group duties include, but are not limited to the following:
- a) monitoring fatigue information sources;
 - b) investigating fatigue-related issues;
 - c) requesting internal audit of specific issues;
 - d) proposing solutions to fatigue-related issues;
 - e) making recommendations on priorities for targeting fatigue management resources;
 - f) providing transparent and timely feedback to the workforce;
 - g) providing transparent and timely feedback to higher management;
 - h) cooperating with internal and regulator audits;
 - i) overseeing the quality assurance of fatigue risk management training (initial and on-going) across the organization;
 - j) assisting in schedules development, modeling and schedule modifications;
 - k) development of agreed processes and procedures for data collection; and
 - l) confidential dissemination and sharing of data for discussion within the group
- c. The Regulator's Responsibilities

The Regulator must evaluate an operator's proposed FRMS and determine its adequacy and approve/reject the FRMS. A Regulator may provide limited approval of certain elements of the FRMS based upon the amount of safety data provided by the operator to validate the safety issues involved. The Regulator must also review the required reports

and where data suggests any negative safety issues work with the operator to develop processes or changes in the operator's FRMS to mitigate any safety issues. The Regulator must periodically audit the FRMS to evaluate its overall effectiveness in maintaining the required safety performance. Based upon this audit the Regulator may adjust, modify, suspend or revoke any authorization to implement and maintain an FRMS.

d. The Operator's Responsibilities

- (1) The Operator must develop a proposal for an FRMS that addresses all the requirements stated above and provide it to the Regulator for evaluation. The operator should work cooperatively with the Regulator to address any issues that may need to be modified so as to get the Regulator's initial and continuing approval. The Operator must provide the Regulator any reports or data that suggest any negative safety issues and work with the Regulator to develop satisfactory processes or changes in order to mitigate any safety issues. Operators should reflect, in their operations manuals, those elements of their operations under the FRMS.
- (2) The Operator must provide FRMS education and awareness training to all stakeholder personnel (e.g., pilots, cabin crew, flight operations / cabin crew management personnel, rostering personnel / schedulers, planners etc) and accomplish all the requirements stated in the operator's FRMS before the FRMS may be used in actual operations.
- (3) The Operator must accept joint FRMS partnership between management and staff and encourage participation within the FRMS through open and honest communication. The Operator must provide adequate resources to maintain and improve the FRMS as knowledge is gained and data is collected. Operators should ensure that sufficient personnel and personnel with the appropriate physiological scientific expertise are available to advise the Fatigue Management Steering Group.

(e) Crewmembers' Responsibilities

- (1) A Crewmember must not operate an airplane when he or she knows that he or she is fatigued or feels unfit to the extent that the safety of flight may be adversely affected. Crewmembers must report any instance when he/she believes that they are fatigued and that safety may be affected.
- (2) Crewmembers should make best use of the facilities and opportunities that are provided for rest, sleep, and for the consumption of meals, and they should plan and use their rest and sleep periods to ensure that they are as adequately rested as possible before beginning their next duty period.
- (3) Crewmembers must be a "full" partner in the development and implementation of the FRMS and must accomplish all tasks required within the FRMS.

16. Records and reports.

Each air carrier must report scheduling reliability data to the Regulator every month in a form and manner prescribed by the Regulator.